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THE EFFECT OF A NURSING CONCEPTUAL FRAMEWORK ON PROBLEM SOLVING AND RETENTION

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ABSTRACT

This study intends to provide some insights during curriculum innovation in nursing education. Local nursing curricula tend to focus on medical facts and the study programs are arranged mainly by accumulation of facts. Many educators such as Ausubel, Schwab, Bruner, and Kelly have declared that the structure of knowledge of a discipline is very significant to induce meaningful learning. Meaningful learning implies that students can defend the acquired knowledge, recall what they have learned and transfer their learning to new situations. Contemporary medical services demand nurses to effectively deal with the rapid evolvement of medical technology, and at the same time, provide quality individual care. In the preparation of qualified nurses, the facilitation of meaningful learning is particularly important. Adopting the structure of knowledge that is specific to the discipline can be conducive to meaningful learning. Ausubel specifically suggests that the structure should be presented to students as advance organizer in order to secure students with a cognitive structure.

Based on the above ideation, the treatment in this study involves the provision of a nursing framework as advance organizer. Two groups of student nurses with one-year nursing experience are used as study subjects. The treatment is applied in a series of 10 lectures pertaining to the study of surgical nursing of patients with respiratory problems.

Quantitative and qualitative methods are used. The quantitative data collection and analysis consist of three parts. First, pretests and posttests are conducted. Results are analysed using analysis of covariance with pretest scores as covariate. Main effects of treatment, of ability and of the interaction between treatment and ability are looked into. Second, frequency counts of the observation of students' cognitive behaviour between the treatment and control groups are compared using t-test. Third, results of the questionnaires between the two groups are also compared using t-test. The qualitative part refers to the comments provided by students in the open-type questions of the questionnaire.

Results of this study have portrayed a very interesting picture of the use of advance organizer in nursing education. The findings could be displayed on a line of continuum. The continuum is marked by the cognitive domain at one end, and the affective domain at the other. At the end of the cognitive domain, it is represented by the test results which suggest that the control group excel the treatment group in cognitive performance. In the middle of the continuum is the classroom cognitive behaviour. Observation results reveal that there is no significant difference in the cognitive level between the control and treatment group during lecture. At the other end of the continuum is the affective domain. Findings of the questionnaires show that students in the treatment group express a significant degree of favouritism

towards the use of advance organizer. Results also reveal that the main effect of students' ability in test performance is insignificant, and there is no interaction between treatment and ability. Taking it all in all, it cannot be concluded that the advance organizer when adopted in nursing education is helpful or not helpful. Moreover, it can be postulated that advance organizer is useful to arouse students' learning interest. In regard to the effect of the advance organizer on cognitive performance, further studies would be required.

CHAPTER 1

INTRODUCTION

1.1 Background and Problem of the Study

The nurses' training programs in Hong Kong at present are all hospital-based, that is, the schools of nursing are attached to hospitals. Student nurses are employed by the hospital, therefore each student nurse possesses a dual role of a worker as well as a learner. During the three-year (156 weeks) training period, there are 34-38 weeks of theoretical input. Students spend the rest of their training period in the clinical area working, and presumably learning. Learning in the clinical area, however, is not always guaranteed to occur. The author carried out a study in 1984. Results indicated that clinical teaching and learning activities were minimal in reality. In fact, many studies in the United Kingdom have already revealed that such kind of training system forfeit the learner role of the student (Briggs 1972, Birch 1975, Pearson 1978, Fretwell 1983, Reid 1983, Wong 1984). Students are counted as a pair of hands. As a result, students often have to perform nursing activities without supervision, and sometimes without prior knowledge. To remedy this, before any radical change can take place in time, it is especially important to structure the knowledge in a way that students not only know how to transfer previously learned principles to newly encountered

situations, but also have the ability to justify one's decision to act, or in some circumstances, not to act, when he/she does not have the required cognition, psychomotor skills, and social skills. This is in alignment with the demand made by the Royal College of Nursing in the United KIngdom which requires each nurse to assume individual responsibility for systematically assessing each patient's nursing needs, planning the care, making decisions and judgements, and taking independent actions.

1.2 Purpose of the Study

In 1975, the National League of Nursing of the United States produced a mandate requiring all nurse training institutes to develop their curricula within a conceptual framework consistent with the philosophy and objectives of their courses (Collister 1983; Flaskerud 1983). It has been more than ten years now since our counterparts in the United States have made this claim. It seems that none of the local nursing curricula has been built on a nursing framework/ model and this is not required by the local authority. This study attempts to investigate if the use of a nursing conceptual framework as an advance organizer can enhance the effect of learning among nursing students. The effect of learning is specified by retention and problem solving in this study.

1.3 Significance of the Study

This research was carried out in a local school of nursing. Approximately one hundred and ten students participated in the main study. The study involved the teaching of the respiratory system in surgical nursing. It is appreciated that the scope of this study is rather limited. However, by adopting a more comprehensive approach during evaluation, it is hoped that this study would provide some insights for prospective curriculum design and studies.

CHAPTER 2

LITERATURE REVIEW

2.1 The Significance of Using Knowledge Structure in Curriculum Construction

The discipline of nursing has relied heavily on the discipline of medicine since the times of Florence Nightingale. It is not uncommon to find that the course content of the nurse training program aligns with the medical specialties such as medical nursing, surgical nursing, geriatric nursing and so on. A typical nursing lecture might begin with a revision of the related anatomy and physiology, followed by a discourse of the pathophysiology with an enumeration of the signs and symptoms, and end with the nursing care required (Mallick 1977). Bevis (1982) describes this kind of teaching as watering down medical information with a few hints about 'nursing implications', to sweeten the dose of medicine. This does not mean that the information concerning pathophysiology, signs and symptoms and the like is not important. However, the above arrangement seems to carry an assumption that the nurse student, after accumulation of medical facts, will know how to consume the information in the provision of nursing care. According to Kelly (1977), the combination of subjects and areas of knowledge cannot be arbitrary. The collection of subject matter must have central focus in order to ensure that learning has meaning and relevance for the students. Schwab

(1976) also echoes that the way knowledge is structured is significant to learning. Schwab explains that older knowledge tends to assume the shape of a catalogue and students would learn facts placed under different classifications. However, modern inquiry tends to look for patterns, patterns of relations and patterns of change. And, the structure of knowledge of a discipline should consist of "the body of imposed conceptions which defines the investigated subject matter of that discipline and controls its inquiries." Schwab further produces five arguments in defending the significance to structure knowledge in a way the students would inquire not mere facts, but facts about the kinds of association involved and the consequences of association. The first argument is that one cannot, teach the conclusions of a discipline as if they were about the whole subject matter and were the whole truth. The conceptions should be used as guiding principles of inquiry, and not verified knowledge, immediate fruits of inquiry. The bodies of knowledge would have defensible and valuable meaning to those who learn them, not in a context of dogma, but in a context of the conceptions and data that determine their limited meaning and confer their limited validity. The second argument in defense of the significance of the structure of a discipline to education is that as the principles of inquiry are used, two consequences ensue. They are that knowledge of subject unfolds and inquiry techniques are refined and invented. The result is that former

knowledge is embodied and replaced by new facts and there is then a continuing and pervasive revision of knowledge. The third and fourth significance emerge from the outcomes of the above process. The successful search for more valid principles has led to principles which embrace more and more of the richness and complexity of the subject under investigation, as well as a wider scope of principles, embracing a larger range of subject matter. The fifth argument presented by Schwab is that as the scope of a set of principles enlarges so will the coherence of the body of knowledge.

Bruner also advocates the view that the structure of a discipline is significant in education. Bruner (1962) demands that when teaching specific topics or skills, the foundamental structure of a field of knowledge should be made clear to the students. At the same time, students should get mastery of the structure. Bruner explains that mastery of the structure involves not only the grasping of general principles, but also the development of an attitude toward learning and inquiry, toward the possibility of solving problems on one's own. Bruner adopts a negative approach in defending his point. He argues that teaching without students mastering the knowledge structure is uneconomical in several deep senses. First, such teaching makes it exceedingly difficult for the student to generalize from what he/she has learned to what he/she will encounter later; that

is referred as 'transfer of learning'. Bruner particularly refers to the non-specific type of transfer, that is, transfer of principles and attitudes. He claims that this type of transfer is at the heart of the educational process, because it will continually broaden and deepen knowledge. Second, such teaching deprives students of intellectual excitement. The falling short of a grasp of general principles makes students unable to use the knowledge beyond the situation in which learning has occurred. This creates little interest because students render the knowledge not worth knowing. Third, such teaching reduces human memory. Without sufficient structure to tie knowledge together, it is very likely to be forgotten.

Ausubel as well emphasizes the significance of the structure of knowledge. Ausubel (1976) terms the attributes of the logical structure of the subject matter as the 'logical/potential meaning'. Subject-matter material possesses logical or potential meaning if 'it consists of possible and nonarbitrary relationships that are relatable on a nonarbitrary, substantive basis to a hypothetical human cognitive structure exhibiting, in general, their necessary ideational background and cognitive maturity' (Ausubel 1976:25). By non-arbitrariness, Ausubel implies the possibility of transforming the logical (potential) meaning into the psychological meaning, if the learner possesses the required cognitive structure. Substantiveness means that the

relationship of the material will not be altered when a different but equivalent form of wording is used. This logical/potential meaning thus can only be converted into actual meaning when incorporated with the individual learner who possesses the corresponding psychological structure.

Kelly, Schwab, Bruner, and Ausubel all agree that structuring knowledge in a fashion that reflects the specific relationships of a discipline is conducive to learning. Bruner and Ausubel insist that the knowledge structure should be made known to students. However, Ausubel specifically demands that in order to secure students with a cognitive structure in the preparation for meaningful learning, the structure should be presented as advance organizer, which is defined as "an appropriate, relevant and inclusive introductory materials ... introduced in advance of learning ... and presented at a higher level of abstraction, generality and inclusiveness" (Ausubel 1968:18). The advance organizer is believed by Ausubel to provide "ideational scaffolding for the stable incorporation and retention of the more detailed and differentiated material that follows."

A conceptual framework can serve the purpose of an advance organizer considering the definition offered by Fawcett. Fawcett (1985:2) in her literature search concludes that a conceptual framework is "a set of concepts and statements that are integrated into a meaningful

configuration providing a certain frame of reference for members of a discipline, telling them what to look at and to speculate about. Most importantly, it determines how the world is viewed and what aspects of that world is viewed and what aspects that world are to be taken into account." A conceptual framework fulfills Ausubel's criteria of an advance organizer, that is abstraction, generality and inclusiveness; and it provides a knowledge structure of the discipline concerned.

Before exploring further the effect of adopting an advance organizer in education, it is necessary to consider the possible limitations if the knowledge structure is over-emphasized in the construction of the curriculum.

2.2 The Limitations of Using a Knowledge Structure in Curriculum Construction

The above paragraphs tend to adopt the view that grasping the structure of a discipline would launch students adequately for further learning. Strike & Posner (1976) propose two points that are worth considering to avoid excessive reliance on the 'structure-of-the-discipline approach'. They are "first, the fact that grasping the structure of a discipline is important in understanding and manipulating the concept of that discipline provides no illumination for the conditions under which the structure is acquired. Children or adults may be unable to deal with such

concepts for a variety of reasons, ranging from innate ability to cognitive style to stage of cognitive development. Second, while it may be the case that a grasp of the central concepts of a discipline is necessary for manipulating the detail of a discipline, it is clearly not sufficient. One thus need to distinguish the logical power of a set of concepts (what the concepts are in principle capable of doing) from the cognitive power of these concepts for a given learner (what a person can do with them)" (Strike & Posner 1976:120). Ausubel (1973) has similarly pointed out that the psychological organization of knowledge uses the laws of meaningful learning and retention which implies a hierarchial type of structure; whereas the laws governing the logical organization of knowledge are derived from the logic of classifications which strives for topical relatedness and homogeneity. The knowledge structure referring to the internal logic of the subject matter does not always agree with the psychological structure in which learning can best take place. Ideally, curriculum organization should preserve and provide both the logic of the subject matter and the psychological sequences of the learning experiences (Taba 1962).

2.3. The Effects of Learning When Providing the Structure of Knowledge as an Advance Organizer

Advance organizer, as mentioned above, is defined as "an appropriate relevant and inclusive introductory materials

... introduced in advance of learning ... and presented at a higher level of abstraction, generality and inclusiveness" (Ausubel 1968). It is viewed as an intellectual map that students can use in analyzing particular domains and solving problems within these domains (Joyce & Weil 1980). Lorch & Lorch (1985) would suggest that it is a retrieval plan to guide text recall. Mayer (1979) however would argue that the organizer is a learning aid rather than a retrieval aid. He explains that if the organizer is a retrieval aid, there should be no difference in test performance between subjects given an organizer before or after learning since both groups have access to the organizer as a retrieval aid during the test. Mayer cites his own studies to prove that the before group performs better on the breadth of transfer and excels the after group on conceptual idea and on relating the material to other ideas. The studies will be further discussed in the later text. Mayer (1979:382) has attributed this far transfer effects to the function of the organizer as an encoding aid, which is claimed to serve either of the two functions :

i) "to provide a new general organization as an assimilation context that should not have normally been present";

ii) "to activate a general organization from the learner's existing knowledge that would not have normally been used to assimilate the new material."

Dinnel & Glover (1985) in their study attempt to manipulate the encoding process of the organizer to see if there is any difference in effect on recall. The subjects used were college students who majored in elementary education. The material selected was the formation of the solar system. There were four experimental groups. Group one was presented with true organizer with paraphase. Group two was presented with true organizer only. Group three was presented with control organizer with paraphase. Group four was presented with control organizer only. The true organizer was developed on the basis of Ausubel's description, which provided students with knowledge about the use of models in science for understanding astronomical phenonmena. The control organizer was about early ideas of planetary movement. The paraphase treatment required students to paraphase the organizer on a sheet of blank paper. The results generally confirmed the predictions that group one performed better than group two, two better than three, and three better than four. However, significant differences were only observed among the conditions between the true organizer with paraphase condition and each of the other condition. Dinnel & Glover conclude from their study that if the new bridge-building material is not well learned as facilitated by paraphasing, it seems highly unlikely that it could enhance the comprehension of subsequent material. That probably explains why some experimental results suggested that advance organizer might not be always effective.

Indeed, there have been mixed findings concerning the effects of the advance organizer. A number of studies reviewed acknowledge the effect of the advance organizer on retention of learning/recall. They include studies by Lawton (1977), Mayer (1979), Hozman & Allen (1981), Derry (1984), Dinnel & Glover (1985), Lorch & Lorch (1985), and the study by Stone (1983) who has reviewed 112 studies in 29 reports. Barnes & Clawson (1975) however, in analyzing 32 studies report that only 12 were favourable and the other 20 were unfavourable. They have analyzed the studies according to selected variables and found that advance organizers did not have differential effects with the length of treatment, ability level of students, grade level of students and the type of organizers used.

Based on the analysis, Barnes & Clawson conclude that the efficacy of advance organizer has not been established. They criticize Ausubel for not defining the advance organizer operationally. They recommend that further studies should be conducted to investigate the effects of operationally defined advance organizers and further studies should be conducted with students at all age levels, of different ability, in a variety of subject areas with learning at all levels of the cognitive domain using a wide variety of non-written organizers. The long-term effects of the advance organizer should be established.

Mayer (1979) carries out experiments in an attempt

to overcome the problems mentioned by Barnes & Clawson. Mayer manages to produce consistent evidence to support the view that advance organizer could influence the outcome of learning if used in appropriate situations and measured properly. In addition, Mayer has made an effort to explore the effects of advance organizer from various perspectives. The tests presented by Mayer that are related to this study will be briefly discussed below.

A. Effects of Advance Organizer on the Breadth of Trasfer

Two groups of college freshmen were asked to read a computer text. The treatment group with an advance organizer provided performed better than the control group on far transfer problems. The result was about the same when subjects were tested on near transfer problems. The explanation given was that the advance organizer group, by virtue of having a 'cognitive anchor', assimilated the material to a broader set of past experiences.

B. Effects of Sequencing of Advance Organizer on the Breadth of Transfer

This test was arranged in such a fashion that one group would receive the advance organizer before, and one group after instruction. The before group performed better than the after group. This test supported the explanation that the organizer was helpful in assimilation encoding rather than as a retrieval aid.

C. Effects of Advance Organizer on the Structure of Recall

The arrangement was the same as in B. Subjects were then asked to recall selected portions of the text. The before group excelled on conceptual idea units and on relating the material to other ideas; this type of behaviour seemed to favour far transfer performance. The after group retained the technical detail which seemed to be more useful for near transfer tasks.

D. Effects of Advance Organizers for Different Attribute Level

It was found that the treatment x posttest interaction was strong for subjects scoring below average in SAT but not for those scoring above average.

Mayer recognizes that the limitations of his studies are that the subjects chosen were mainly college students and the instructed materials selected were confined to a few types only. However, Mayer maintains that it is reasonable to conclude that advance organizer could influence the outcome of learning.

Stone (1983) using metaanalysis in his review of 112 studies discloses different perspectives concerning the issue of using advance organizer in learning. He expresses each study by its effect size. Effect size by definition is equal to mean posttest score of the treatment group minus the mean posttest score of the control group, then divided by the standard deviation of the control group. Stone, like Mayer

finds that advance organizer is associated with increased learning and retention of the material to be learned. However, Stone's review produces no evidence indicating any special facilitation for low-ability or low-knowledge students. Older students who were more likely to be at formal-operational level did not benefit from the organizer any more than the concrete-operational students. The organizer effect in longer studies was not confirmed. However, high-effective size was associated with non-written/ illustrated expository type organizers; when the organizers combined concepts and processes taken from the material to be learned, and when the subject group seemed to be in science and mathematics. Luiten, Ames & Ackerson (1980) similarly have employed the metaanalysis technique to examine 135 studies concerning the effects of advance organizers. Similar to Stone, Luiten et al. agree that the average effect size of the advance organizer on learning and retention is positive. However, Luiten et al. disclose that participants defined as high ability have an average effect size about twice that of low-ability participants; the effect size seems to increase across time and the average effect size for students using college and special education students can be seen to be greater than that of studies involving secondary or primary school students.

A number of researchers have pointed out that the organizer model itself has an inherent weakness that needs to

be overcome, that is, the lack of clarity of what makes a good advance organizer. Ausubel (1978, 1980) defends himself by claiming that the accusations are unsubstantiated and that his original writings should have been consulted as the primary source, instead of quoting various inaccurate, misleading and mispresented material. Mayer's work is one of the very few that is recommended by Ausubel (1980) as 'searching and objective'. Mayer (1979:382) in his research attempts to provide information concerning how an advance organizer should be defined. He claims that an advance organizer generally has each of the following characteristics:

"(a) short set of verbal or visual information;

(b) presented prior to learning a large body of to-be-learned information;

(c) containing no specific content from the to-be-learned information;

(d) providing a means of generating the logical relationships among the elements in the to-be-learned information;

(e) influencing the learner's encoding process".

Mayer adds that the organizers are always relative to the particular learner and subject matter. For instance, a passage that served as an advance organizer for one learner might not be viewed the same for another learner.

There have been many researchers discussing the use of

advance organizers in learning. Equal amount of studies with favourable and unfavourable results could be found. More studies manipulating each variable in a variety of ways would help to establish the efficacy of the organizer. The criteria originally stated by Ausubel, that is, abstraction, generality and inclusiveness needs to be observed in developing the advance organizer appropriate to the subject area in the study, in order that study results could be comparable among each other.

2.4 The Nursing Conceptual Framework

With the development of nursing sciences within this decade, quite a number of nursing models have been introduced. Among the models, four metaparadigms have often been used as the centre of discussion. They are person, environment, health, and nursing. Different models provide different views of the central concepts which will be discussed below. Person, is often identified as an integrated bio-psycho-social being. However, the being is defined as, in Orem's (1971) self-care model, a self-care agent; in Roy's (1976) adaptation model, an adaptive system; in Johnson's (1980) behavioural system model, a behavioural system, and so on. Environment is frequently identified as family members, the community, society as well as the person's physical surroundings. The environment has been seen as a source of stressors on one hand, and a kind of resources on another. Health is also presented in various

ways. It has been depicted as a continuum from adpatation to maladaptation in Roy's model, and dependence to independence in Orem's model. Nursing interventions and goals are designed in accordance with various conceptions. For instance, in Orem's self-care model, the nursing goal is to assist clients to overcome any interference that inhibits the self-care ability of the individual. In Roy's adaptation model, the nursing goal is to help the client to achieve health by adjusting the four identified adaptative modes, which are the physiological, self-concept, role, and interpersonal modes (Aggleton & Chalmer 1984; Fawcett 1985).

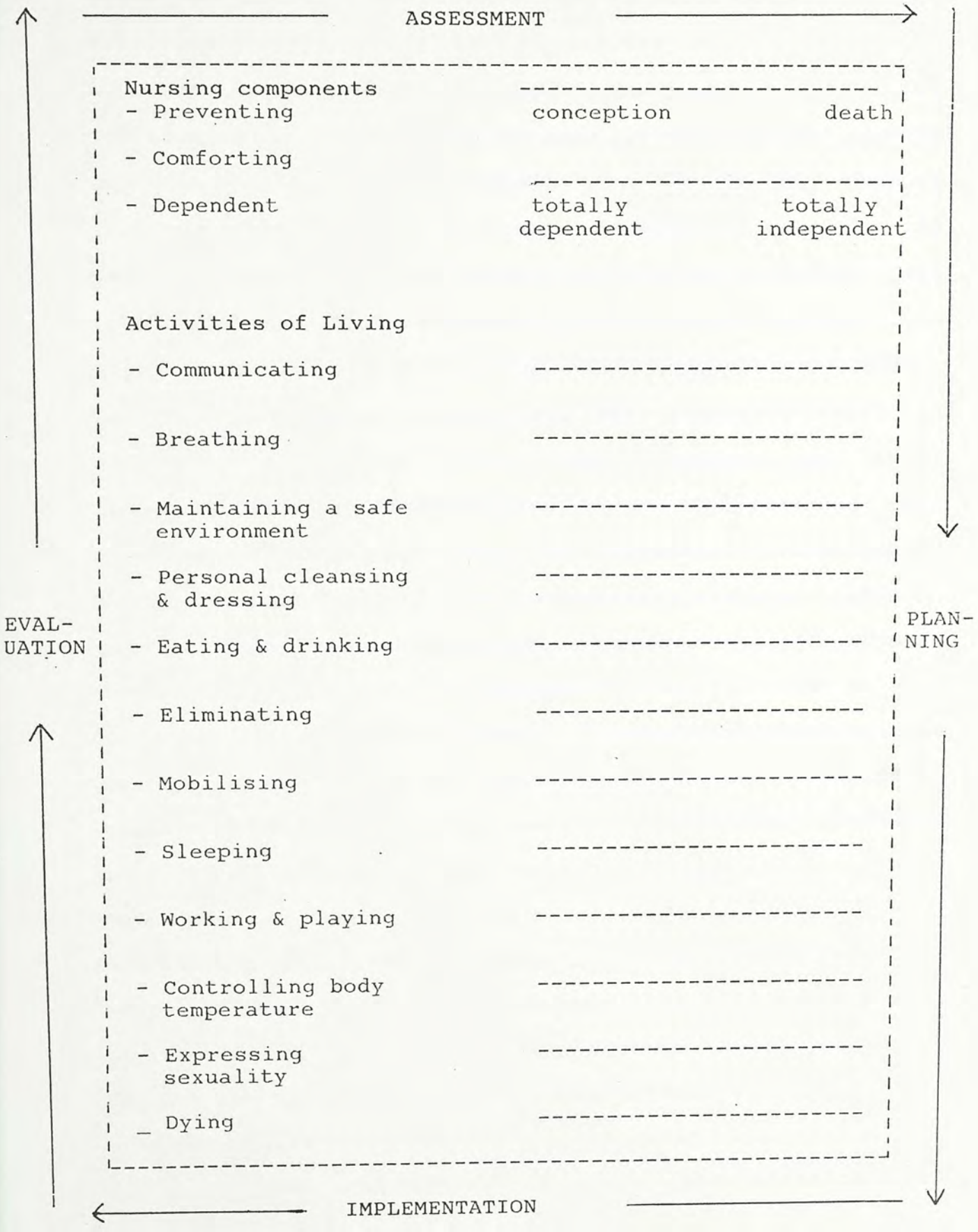
There has been discussion concerning whether a curriculum should be built on a single framework or multiple frameworks. Flaskerud (1983) proclaims that the use of multiple frameworks is common to most basic level nursing programs. For instance, medical-surgical nursing teaches that nursing is an attempt to assist correcting the ill-health caused by diseases; obstetric nursing teaches that nursing is an intervention in a life event and so on. Quiring & Gray (1982) in their study attempt to identify models employed and their frequency of use in nursing schools. They report that multiple conceptual frameworks have been used. Although there are nurse educators, such as Stephenson (1986), who have made a deliberate decision not to design the curriculum on a specific model of nursing, there are others like Quiring & Gray (1982), Flaskerud (1983) and Kermode (1986) who tend to agree on the use of a single

model. The arguments have been that the use of multiple conceptualizations would confuse students, make knowledge compartmentalized and fractioned. The use of one single model makes the curriculum design simplier if the particular model could encompass all of the essential aspects in nursing. There is a possibility that one model requires the complement of another during curriculum design.

Among all the models available, Nancy Roper's Activities of Living Model will be discussed in more details here. This model is selected not because it is faultless, but mainly because the school of nursing involved in this study has adopted Roper's model in their prospective curriculum planning. Partial elements of the model have been introduced to the students at their introductory course. This model is relatively simple and students would find it comparatively easy to comprehend.

Roper's Activities of Living Model was first introduced in 1976 (see Figure 1 on p.21). Roper et al. (1983) believe that most people could compose a list of everyday activities which they carry out in the process of living. They identify twelve activities of living (AL) which are communicating, breathing, maintaining a safe environment, personal cleansing and dressing, eating and drinking, eliminating, mobilising, sleeping, working and playing, controlling body temperature, expressing sexuality, and dying. Each activity is complex and they are interrelated. For instance, communicating

Figure 1 : Roper's Activities of Living Model (1976)



permeates several of the others - it would be unfortunate that eating and drinking, working and playing and expressing sexuality are performed without communication. It is reminded that only for the purpose of description can the activities be separated. Although the ALs are the focus of the model of living, a couple dimensions of living are included in it since they affect the ALs. They are the life-span of living and the dependence/independence continuum. As a person moves along the life-span from conception to death, he/she is continually changing and every aspect of living is influenced by physical, intellectual, emotional and social changes. These are circumstances in life that make one more dependent than others, such as the mentally handicapped. Nursing takes account of the individual's stage of life and provides nursing care according to their level of independence, relating to the activities of living. Roper et al. further identify three types of activities which are the preventing, comforting and dependent components. Examples of these activities would be preventing complication, providing physical/mental comfort, and carrying out tasks that are the dependent part of the nurses's role, such as administering medications prescribed by the doctor. Again, it is reminded that the three components are interrelated. For instance, in giving out medication, the nurse attends to the patient's comfort and takes all precautions to prevent accidents. The priorities will be reflected on Maslow's human need model. In this case, the biological AL would be attended first

before the psycho-social. The model is suggested to be used as a framework and the nursing process as a mode of thinking. The nursing process is a logical way of thinking, beginning with assessment of patient's needs/problems, planning care according to the identified needs/problems, then implementing the care. Evaluation would end the process if the nursing goal is achieved, or it would carry through to the assessment phase again if revision of care is indicated.

2.5 Curriculum Evaluation

Scriven (1967) views curriculum evaluation as simply gathering and combining of performance data with a weighted set of goal scales to yield either comparative or numerical ratings. A working definition provided by Tawney (1976) is that curriculum evaluation is the collection and provision of evidence, on the basis of which decisions can be taken about the feasibility, effectiveness and educational value of curricula. There are two distinct paradigms of curiculum evaluation, the objective approach/psychomotor approach/ agricultural-botany paradigm versus the anthropological approach/illuminative paradigm. The former utilizes a hypothetico-deductive methodology derived from the experimental and mental testing traditions in psychology. It focuses on goal achievement, ignoring the characteristics of the learning environment and the interacton of learners and teachers of that environment. The latter takes account of

the wider contexts in which educational innovation functions. The primary concern is with description and interpretation rather than measurement and prediction. The aims of illuminative evaluation are to study the innovatory project: how it operates, how it is influenced by the various school situations in which it is applied; what those directly concerned regard as its advantages and disadvantages and how students' intellectual tasks and academic experiences are most affected. Two central concepts of this strategy are the instructional system and the learning mileu. There are three characteristic stages: the investigators observe, inquire further and then seek to explain. Within this three-stage framework, an information profile is assembled using data collected from four areas: observation, interviews, questionnaires and tests, documentary and background sources (Hamilton & Parlett 1976).

The agricultural-botany paradigm and the illuminative paradigm obviously take two very different perspectives in evaluating a curriculum. Bishop (1985) reminds one of the reality of a curriculum, which necessarily involves a complex network of social, cultural, philosophical, moral, political and ideological issues. The illuminative paradigm focuses beyond the end-stage, attempting to provide a more comprehensive and realistic view of a curriculum innovation program. The adoption of multiple methods in the approach can also provide a cross-checking effect which can ensure the reliability and validity of the investigation.

CHAPTER 3

FORMULATION OF HYPOTHESES AND METHODOLOGY

3.1 Statements of Hypotheses

Based on the literature review, the null hypotheses of this study are formulated as follows.

Hypothesis 1

There is no significant difference in the mean scores of the posttest of retention between the treatment group and the control group using pretest scores as covariate.

Hypothesis 2

There is no significant difference in the mean scores of the posttest of problem solving between the treatment group and the control group using pretest scores as covariate.

Hypothesis 3

There is no significant difference in the mean scores of the posttest of retention between the high ability students and the low ability students using pretest scores as covariate.

Hypothesis 4

There is no significant difference in the mean scores of the posttest of problem solving between the high ability students and the low ability students using pretest scores as covariate.

Hypothesis 5

There is no significant interaction between ability of students and the treatment in the mean scores of the posttest of retention using pretest scores as covariate.

Hypothesis 6

There is no significant interaction between ability of students and the treatment in the mean scores of the posttest of problem solving using pretest scores as covariate.

3.2 Methodology

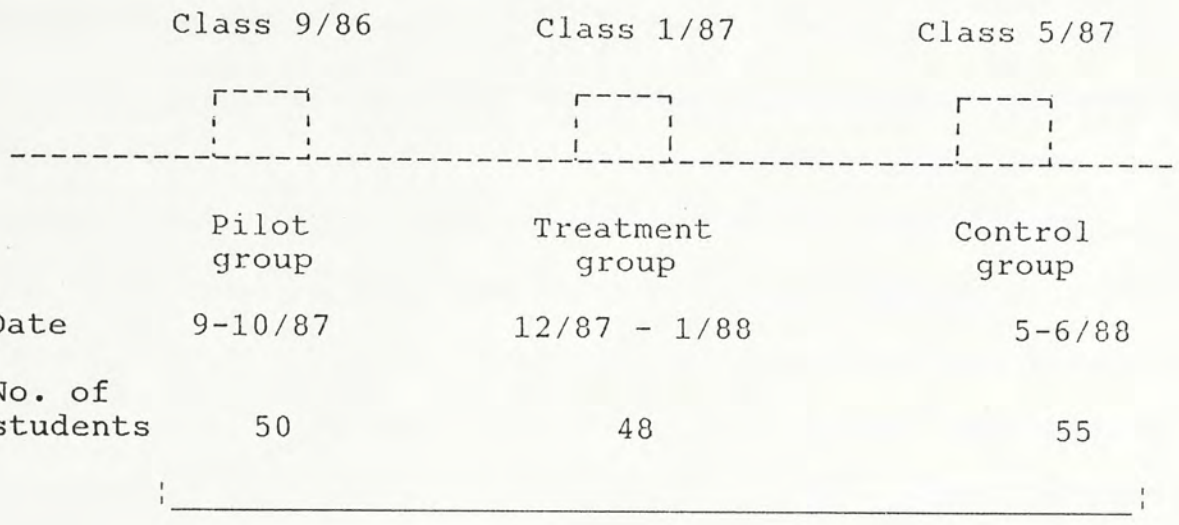
This study is a field test which was carried out in the Nethersole School of Nursing with the kind permission of the authority concerned (see Appendix 1 for the request letter).

Data collection and analysis are both quantitative and qualitative, referencing the illuminative approach. A pilot study was carried out in October, 1987 and some of the original research plans were revised based on the insights obtained from the pilot project. The research strategies are each described below.

3.2.1 Selection of Subjects

Three classes of nursing students of 12-month experience were invited to participate. Due to the difficulty of timetabling and the intensity of the study blcok, a single class within the same period could not be split into two to be used as the control and treatment group. The research span had to be extended to accomodate three classes of students of the same level before the study could be completed. The scheme is shown on the next page.

Figure 2 : The Research Scheme



3.2.2 Arrangement of Lectures

The study content involved ten one-hour surgical nursing lectures pertaining to the respiratory system. The arrangement is displayed in the following tables.

Arrangement Prior To The Pilot Study

Table 1 : Arrangement of Lectures Prior To the Pilot Study

Content \ Hours	Treatment Group	
Organizer	1 (Advance organizer)	0.5 (Control organizer)
Tracheostomy	2.5	2.5
Chest injuries	2	2
Lung abscess & empyema	1.5	2
Lung tumours	3	3
TOTAL	10	10

The original plan is shown in Table 1 on p.27. The advance organizer that the treatment group have received involved an overview of the Roper's Activities of Living Model (see Apppendix 2) and a standardized pre- and post-operative care plan written by the researcher with particular reference to Roper's model (see Appendix 3). The discussion of nursing care during treatment was based on Roper's model as well. The control group received the standardized pre- and post-operative care plan material without any indication of using a nursing model (see Appendix 4). The standardized care plan was given as a control organizer. It is not a true organizer because it does not fulfill Ausubel's criteria of an organizer, that is, at a higher level of abstraction, generality and inclusiveness. The discussion of nursing care in the control group had no particular nursing model to refer to.

Arrangement After The Pilot Study

The arrangement before and after the pilot study was very similar. The original scheme was revised in an attempt to create more opportunities for students to participate in the process of, and demonstrate their ability in, problem solving. Therefore, in the main study, more time was allocated to those sessions requiring group discussion. Modified patient profiles depicting different respiratory conditions were provided to students as a basis for group discussion. The same teaching methodology was adopted in both groups. However, the treatment group was guided to use

Roper's model during their discussion. The revised arrangement is shown in Table 2 below.

Table 2 : Revised Arrangement of Lectures After Pilot Study

Content \ Hours	Treatment Group	Control Group
Organizer	0.5 (Advance organizer)	0.5 (Control organizer)
Tracheostomy	3	3
Chest injuries	2.5	2.5
Lung abscess & empyema	1	1
Lung tumours	3	3
TOTAL	10	10

3.2.3 Student Ability Level

The previous examination results of each student in the selected class were gathered from the student files. The examinations included two Anatomy and Physiology papers, two Basic Nursing papers, one First Aid and Personal & Communal Health paper, one Nutrition and Microbiology paper, one Surgical Nursing paper and one Gynaecological Nursing paper. Each unit paper weighed 50%. A mean score of the eight examination results of each student was calculated. The standard deviation of the academic results was also computed. High ability students of the class were the group half

standard deviation above the mean and similarly, low ability students, half standard deviation below the mean.

3.2.4 Pre- and Post-tests

The pretest was the same as the posttest, which lasted forty-five minutes (see Appendix 5). It was designed by the researcher to include both retention and problem-solving type items. Retention type items were taken from the lecture notes. Students would just need to recall what they had learned in class when answering these items. There were four retention type questions as listed follows:

- list the indications of tracheostomy
- list the signs and symptoms of lung abscess
- list the nursing actions required to relieve the breathing problem of a patient with pneumothorax
- list the home discharge teaching required by a patient after lobectomy

The problem-solving type questions were of two kinds. The first kind required students to re-organize the information they had learned in class before they could answer these questions. The questions were:

- list the bedside facilities required in admitting a patient after tracheostomy
- list the nursing actions required in providing comfort to a patient within the first twenty-four hours after pneumonectomy

The second kind required students to solve novel problems. Two authentic cases taken from the clinical area were presented to the students. Students were required to identify patient's current problems with the proposed nursing care plan.

Revisions were made after the administration of the pretest during the pilot study. The students showed expressions of tiredness by the first 30 minutes of the test. Students were originally asked to write the entire care plan for the two given cases. To reduce the amount of writing, the revised test invited students to identify patient's problems with the proposed nursing aims only. The part depicting the required nursing care was abandoned. This part could be tested from the short questions in the other part of the test.

The test items were designed to cover the major subject content learned. The pretest was administered before the first lecture and the posttest, after the last lecture. The time lag between the pre- and post-tests was approximately eight weeks. All lectures were completed by the third week of the study block. The administration of the tests was monitered by the researcher to ensure that students would spend equal amount of time on each item in all the pre- and post-tests because the duration of time would affect the performance.

The tests were marked by the researcher herself to avoid individual differences between markers, in an effort to

ensure test reliability. Tests were marked against a model answer conjointly set up by a nursing lecturer of the Hong Kong Polytechnic, a nursing administrator from a local hospital and the researcher herself to ensure test validity.

3.2.5 Observation

One external observer and one internal observer were invited to participate. The external observer was a nursing lecturer from the Hong Kong Polytechnic. The internal observer was a nurse tutor from the school of nursing. The observers were seated in the corner where they could obtain a good view of the class and the teacher. The time sampling technique of one-minute interval was employed. Every other lecture, that was, a total number of five lectures were being observed. The lectures were tape-recorded for reference use. After observation, the observers would have to code each observed behaviour according to Bloom's taxonomy in the cognitive domain. Table 3 on p.33 shows the general guidelines for coding. The original material produced by Bloom was used as the ultimate reference. Coefficients of correlation of the two observers was calculated to establish the reliability of the observation.

3.2.6 Questionnaire

A questionnaire designed by the researcher was given to each student to invite feedback of the lectures (see Appendix 6). Likert-type questions and open-ended questions were both included. Likert-type questions involved asking students if

they strongly agree / agree / not certain / disagree/ strongly disagree with the proposed statements concerning the ten lectures. The statements are listed on the next page.

Table 3 : Observation Coding Guidance Using Bloom's Taxonomy in the Cognitive Domain

LEVEL	REMARK
KNOWLEDGE	recall of specific and isolable bits of information
COMPREHENSION	lowest level of understanding; one can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications
APPLICATION	the use of abstractions in particular and concrete situations; the abstractions may be in the form of general ideas, rules of procedures, generalized methods, technical principles, ideas and theories which must be remembered and applied
ANALYSIS	the breakdown of a communication into its constituent elements or parts; the relative hierarchy of ideas is made clear; the relations between the ideas expressed are made explicit
SYNTHESIS	the putting together of elements and parts so as to form a whole; to constitute a pattern or structure not clearly there before
EVALUATION	judgments about the value of material and methods for given purposes; use of a standard appraisal

Bloom (1956)

- a thinking framework has been provided to enhance learning
- a thinking framework has been provided to identify nursing problems in general
- a thinking framework has been provided to identify nursing problems of surgical patients in general
- a thinking framework has been provided to identify nursing problems of surgical patients with respiratory conditions
- a thinking framework has been provided to solve nursing problems in general
- a thinking framework has been provided to solve nursing problems of surgical patients in general
- a thinking framework has been provided to solve nursing problems of surgical patients with respiratory conditions
- a thinking framework has been provided to aid memory in general nursing
- a thinking framework has been provided to aid memory in surgical nursing in general
- a thinking framework has been provided to aid memory in the respiratory system of surgical nursing

Open-ended questions included asking students what they found most helpful and least helpful.

CHAPTER 4

RESULTS

4.1 Characteristics of Students

Table 4 : Characteristics of Students

		TREATMENT	CONTROL	PILOT
NUMBER of STUDENTS		55	48	50
ACADEMIC PERFORMANCE	Mean	258.215	268.879	264.809
	SD	28.898	31.744	27.069

All three groups of students were in the twelfth month of their training at the time they participated in the research. The number of each group and their academic performance are shown in Table 4.

4.2 Results of Hypotheses

4.2.1 Hypothesis 1

There is no significant difference in the mean scores of the posttest of retention between the treatment group and the control group using the pretest scores as covariate.

Table 5 on the next page shows that the mean retention pretest scores of the control and treatment group are nearly equal. However the control group have managed to obtain a higher mean retention posttest score.

Table 5 : Means and Standard Deviations for Retention Posttest and Pretest Scores

		CONTROL (N=48)	TREATMENT (N=55)
RETENTION POSTTEST SCORE	Mean	20.453	18.005
	SD	4.275	4.183
RETENTION PRETEST SCORE	Mean	13.979	14.091
	SD	2.639	2.276

Using SPSSX, analysis of variance of retention posttest scores with pretest scores as covariate is executed. Results are shown in Table 6 and 7. Table 6 below indicates that the covariate effect, main effect and the explained effect are significant at the 0.000 to 0.001 level. The control group performed significantly better than the treatment group in retention. Table 7 on the next page shows that 31.6% of the total variance is explained.

Hypothesis 1 is therefore rejected.

Table 6 : Analysis of Covariance of Retention Between the Control and Treatment Group

	F	DF	SIG LEVEL
COVARIATE: retention pretest score	33.814	1	0.000
MAIN EFFECTS: group	12.410	2	0.001
EXPLAINED	23.112	3	0.000

Table 7 : Multiple Classification Analysis of Retention Between the Control and Treatment Group

	UNADJUSTED DEVIATION ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION BETA
CONTROL (N=48)	1.31	1.36
TREATMENT (N=55)	-1.14	-1.19
	0.28	0.29

GRAND MEAN = 19.15
MULTIPLE R = 0.562
MULTIPLE R SQUARED = 0.316

4.2.2 Hypothesis 2

There is no significant difference in the mean scores of the posttest of problem solving between the treatment group and the control group using pretest scores as covariate.

Table 8 : Means and Standard Deviations for Problem-solving Posttest and Pretest Scores

		CONTROL (N=48)	TREATMENT (N=55)
PROBLEM-SOLVING POSTTEST SCORE	Mean	24.661	21.632
	SD	3.625	4.461
PROBLEM-SOLVING PRETEST SCORE	Mean	10.788	10.689
	SD	2.454	2.667

Table 8 on p.37 shows that the mean problem-solving pretest scores of the control and treatment group are nearly equal. However, the control group have obtained a higher posttest score.

Table 9 : Analysis of Covariance of Problem-solving Between the Control and Treatment Group

	F	DF	SIG LEVEL
COVARIATE: problem-solving pretest score	28.681	1	0.000
MAIN EFFECTS: group	11.166	2	0.001
EXPLAINED	19.924	3	0.000

Table 10 : Multiple Classification Analysis of Problem-solving Between the Control and Treatment Group

	UNADJUSTED DEVIATION ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION BETA
CONTROL (N=48)	1.62	1.32
TREATMENT (N=55)	-1.41	-1.16
	0.35	0.29

GRAND MEAN = 23.04
MULTIPLE R = 0.534
MULTIPLE R SQUARED = 0.285

Using SPSSX, the analysis of variance of problem-solving posttest scores with pretest scores as covariate is executed. Results are shown in Table 9 and Table 10 on p. 38. Table 9 displays that the covariate effect, main effect and the explained effect are all significant up to 0.000 to 0.001 level. The control group performed significantly better than the treatment group in problem-solving. Table 10 discloses that 28.5% of the total variance is explained.

Hypothesis 2 is therefore rejected.

4.2.3 Hypothesis 3

There is no significant difference in the mean scores of the posttest of retention between the high ability students and the low ability students using pretest scores as covariate.

The high ability group has been defined as the group with academic performance half standard deviation above the mean; and similarly, the low ability group as the group half standard deviation below the mean. The computation is shown in the following text.

Mean score obtained = 263.185

Standard deviation obtained = 30.578

Half standard deviation = 15.289

∴ High ability group = 263.185 + 15.289
= 278.474
= 278

. .Low ability group = 263.185 - 15.289
= 247.896
= 248

. .Medium ability group = 263.185
= 263

Using SPSSX, the analysis of variance of the posttest retention scores and students' ability with the pretest scores as covariate is executed. Tables 11, 12 and Tables 13, 14 display results of the control group and treatment group respectively.

Table 11 below shows that the retention posttest score is significant at the level of 0.001 using the retention score as covariate in the control group. The main effect of ability is at the marginal significance level of 0.048. Table 12 on the next page displays that only the high ability group enjoys a positive deviation. The proportion of variance explained by ability is 12.3% (0.35 squared). The overall proportion of variance explained is 30.8%.

Table 11 : Analysis of Covariance of Retention Among the Low, Medium and High Ability Students of the Control Group

	F	DF	SIG LEVEL
COVARIATE: retention pretest score	13.131	1	0.001
MAIN EFFECTS: ability	3.247	2	0.048
EXPLAINED	6.542	3	0.001

Table 12 : Multiple Classification Analysis of Retention Among the Low, Medium and High Ability Students of the Control Group

	UNADJUSTED DEVIATION	ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION	BETA
LOW ABILITY (N=10)	-3.08		-2.47	
MEDIUM ABILITY (N=19)	-0.64		-0.21	
HIGH ABILITY (N=19)	2.26		1.51	
		0.48		0.35

GRAND MEAN = 20.45
MULTIPLE R = 0.555
MULTIPLE R SQUARED = 0.308

Table 13 : Analysis of Covariance of Retention Among the Low, Medium and High Ability Students of the Treatment Group

	F	DF	SIG LEVEL
COVARIATE: retention pretest score	24.455	1	0.000
MAIN EFFECTS: ability	0.576	2	n.s.
EXPLAINED	0.536	3	0.000

Referring to Table 13 above and Table 14 on the next page for the treatment group results, the main effects of

ability on retention posttest score with retention pretest score as covariate is insignificant. Both the medium and high ability group enjoy a positive deviation. However, the proportion of variance explained is only 1.7% . Considering both the covariate and ability, the overall explaining effect is raised to 33.4%.

Table 14 : Multiple Classification Analysis of Retention Among the Low, Medium and High Ability Students of the Treatment Group

	UNADJUSTED DEVIATION ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION BETA
LOW ABILITY (N=23)	-1.38	-0.63
MEDIUM ABILITY (N=19)	0.22	0.38
HIGH ABILITY (N=13)	2.13	0.56
	0.33	0.13

GRAND MEAN = 18.00
MULTIPLE R = 0.578
MULTIPLE R SQUARED = 0.334

Since the control group barely reaches the significance level of 0.048 and the treatment group is insignificant, Hypothesis 3 cannot be rejected.

4.2.4 Hypothesis 4

There is no significant difference in the mean scores of the posttest of problem solving between the high ability students and the low ability students using pretest scores as covariate.

Using SPSSX, the analysis of variance of the problem-solving scores and students' ability with the problem-solving pretest scores as covariate is executed. Tables 15, 16 and Tables 17, 18 display results of the control group and the treatment group respectively.

Table 15 : Analysis of Covariance of Problem-solving Among the Low, Medium and High Ability Students of the Control Group

	F	DF	SIG LEVEL
COVARIATE: problem-solving pretest score	5.863	1	0.020
MAIN EFFECTS: ability	2.308	2	n.s.
EXPLAINED	3.493	3	0.023

Tables 15 and 17 show that the main effect of ability on problem solving is insignificant in both the control and treatment group. The high ability students in the control

group exhibit a positive deviation while in the treatment group, only the medium ability group show a slightly positive deviation. The explaining effect of ability is low, 8.4% (0.29 squared) in the control group and 2.0% (0.14 squared) in the treatment group (see Table 16 and Table 18). Considering both the covariate and ability, the overall explaining effect is raised to 19.2% in the control group, 28.0% in the treatment group.

Since there is no significant difference in the results, hypothesis 4 cannot be rejected.

Table 16 : Multiple Classification Analysis of Problem-solving Among the Low, Medium and High Ability Students of the Control Group

	UNADJUSTED DEVIATION	ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION	BETA
LOW ABILITY (N=10)	-1.19		-2.27	
MEDIUM ABILITY (N=19)	-0.89		-1.10	
HIGH ABILITY (N=19)	1.51		1.24	
		0.34		0.29

GRAND MEAN = 24.66
MULTIPLE R = 0.439
MULTIPLE R SQUARED = 0.192

Table 17 : Analysis of Covariance of Problem-solving Among the Low, Medium and High Ability Students of the Treatment Group

	F	DF	SIG LEVEL
COVARIATE:			
problem-solving pretest score	18.542	1	0.000
MAIN EFFECTS:			
ability	0.643	2	n.s.
EXPLAINED	6.610	3	0.001

Table 18 : Multiple Classification Analysis of Problem-solving Among the Low, Medium and High Ability Students of the Treatment Group

	UNADJUSTED DEVIATION	ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION	BETA
LOW ABILITY (N=23)	-1.56		-0.52	
MEDIUM ABILITY (N=19)	0.95		0.02	
HIGH ABILITY (N=13)	1.37		-0.28	
		0.30		0.14

GRAND MEAN = 21.63
MULTIPLE R = 0.529
MULTIPLE R SQUARED = 0.280

4.2.5 Hypothesis 5

There is no significant interaction between ability of students and treatment in the mean scores of the posttest of retention using pretest scores as covariate.

Table 19 : Analysis of Covariance of Retention Interacting Between Ability and Treatment

	F	DF	SIG LEVEL
COVARIATE: retention pretest score	34.817	1	0.000
MAIN EFFECTS:	6.327	3	0.001
group	7.789	1	0.006
ability	3.101	2	0.050
TWO-WAY INTERACTION group x ability	0.382	2	n.s.
EXPLAINED	9.094	6	0.000

Using SPSSX, the analysis of variance of retention posttest scores by students' ability and treatment with retention pretest score as covariate is executed.

Table 19 above shows that the interaction effect of ability and treatment is insignificant. Table 20 on the next page shows that the explaining effect of treatment is 5.8% (0.24 squared), of ability 5.3% (0.23 squared). The overall explaining effect is raised to 35.7% when all factors are taken into account. The main effects of ability reaches a marginal significance of 0.050, and the main effects of group reaches a significance level of 0.006. However, there is no

significant interaction in the posttest scores of retention between ability of students and treatment using pretest scores as covariate. Hypothesis 5 therefore cannot be rejected.

Table 20 : Multiple Classification Analysis of Retention Interacting Between Ability and Treatment

		UNADJUSTED DEVIATION	ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION	BETA
GROUP					
control	(N=48)	1.31		1.10	
treatment	(N=55)	-1.14		-0.96	
			0.28		0.24
ABILITY					
low	(N=33)	-2.30		-1.32	
medium	(N=38)	-0.13		0.17	
high	(N=32)	2.52		1.15	
			0.44		0.23

GRAND MEAN = 19.15
MULTIPLE R = 0.598
MULTIPLE R SQUARED = 0.357

4.2.6 Hypothesis 6

There is no significant interaction between ability of students and treatment in the mean scores of the posttest of problem-solving using pretest scores as covariate.

Using SPSSX, the analysis of variance of problem-solving posttest score by students' ability and treatment with problem-solving pretest scores as covariate is executed.

Table 21 : Analysis of Covariance of Problem-solving Interacting Between Ability and Treatment

	F	DF	SIG LEVEL
COVARIATE:			
problem-solving pretest score	29.194	1	0.000
MAIN EFFECTS:	4.434	3	0.006
group	9.470	1	0.003
ability	0.968	2	n.s.
TWO-WAY INTERACTION			
group x ability	1.925	2	n.s.
EXPLAINED	7.724	6	0.000

Table 22 : Multiple Classification Analysis of Problem-solving Interacting between Ability and Treatment

		UNADJUSTED DEVIATION	ETA	ADJUSTED FOR INDEPENDENT + COVARIATE DEVIATION	BETA
GROUP					
control	(N=48)	1.62		1.23	
treatment	(N=55)	-1.41		-1.07	
			0.35		0.27
ABILITY					
low	(N=33)	-1.94		-0.59	
medium	(N=38)	0.13		-0.16	
high	(N=32)	1.84		0.79	
			0.35		0.13

GRAND MEAN = 23.04
MULTIPLE R = 0.546
MULTIPLE R SQUARED = 0.299

Table 21 shows that the interaction effect of ability and treatment is insignificant. Table 22 shows that the explaining effect of treatment is 7.3% (0.27 squared) and of ability is 1.7% (0.13 squared). When all factors are accounted for, the overall explaining effect is raised to 29.9%. The main effects of group reaches a significance level of 0.003, and the main effects is insignificant. There is no significant interaction in the posttest scores of problem-solving between ability of students and the treatment using pretest scores as covariate. Hypothesis 6 thus cannot be rejected.

4.3 Results of Observation

The two observers have observed two sessions during the pilot study to get themselves familiarized with the coding scheme. There was some discrepancy between the two observers during the training sessions. After clarification and discussion, the degree of agreement was improved in the main study. One-minute interval observation was made.

The result is initially compiled by frequency count. The scott coefficient of agreement is then calculated. The coefficient is defined as:

$$\frac{Po - Pe}{100 - Pe}$$

$$Po = 100 - 1\%A - \%B1$$

$$Pe = (Ave\ \%)^2 = \left[\frac{A + B}{N} \right]^2 \times 100$$

$$N = \text{sum of A} + \text{sum of B}$$

The agreement is only acceptable when it is greater than 0.8 (Flander, 1967). Table 23 and 24 display the frequency count of students' cognitive level of the control and treatment group.

Table 23 : Observation of Students' Cognitive Level of the Control Group

COGNITIVE LEVEL	OBSERVER A	B	%A	%B	100-Po	Pe
KNOWLEDGE	43	44	20.1	20.7	0.6	4.2
COMPREHENSION	109	104	50.9	49.1	1.8	25.0
APPLICATION	46	45	21.5	21.2	0.3	4.6
ANALYSIS	16	19	7.5	9.0	1.5	0.7
SYNTHESIS	0	0	0	0	0	0
EVALUATION	0	0	0	0	0	0
TOTAL	214	212	100	100	4.2	34.5

The scott coefficient of agreement in the observation of the control group is

$$\text{control} = \frac{(100 - 4.2) - 34.5}{100 - 34.5}$$

$$= \frac{61.3}{65.5} = 0.94$$

control is above the acceptable level.

Table 24 : Observation of Students' Cognitive Level of the Treatment Group

COGNITIVE LEVEL	OBSERVER A	B	%A	%B	100-Po	Pe
KNOWLEDGE	71	71	34.1	32.3	1.8	11.0
COMPREHENSION	100	104	48.1	47.3	0.8	22.7
APPLICATION	24	27	11.5	12.3	0.8	1.4
ANALYSIS	10	14	4.8	6.3	1.5	0.3
SYNTHESIS	0	1	0	0.4	0.4	0
EVALUATION	3	3	1.5	1.4	0.1	0
TOTAL	208	220	100	100	5.4	35.4

Referring to Table 24, the scott coefficient of agreement in the observation of the treatment group is:

$$\text{treatment} = \frac{(100 - 5.4) - 35.4}{100 - 35.4}$$

$$= \frac{59.2}{64.6} = 0.92$$

treatment is above the acceptable level.

Once the validity of observation is established, t-test is used to analyse the cognitive level of students involved in the treatment and control group. Low cognitive level embodies the knowledge and comprehension level; medium cognitive level, the application level; high cognitive level, the analysis, synthesis and evaluation level. Table 25 on p.52 fails to produce evidence to support the conjecture that one group would employ cognitive skills higher than the other group. The F value is 0.00 and the 2-tail probability is 1.000 which is absolutely insignificant. In other words, the

application of treatment has not interfered with nor facilitated students' cognitive level during lecture. In view of the narrative notes of the observation, it is indicated that the treatment group students have made no effort in attempting to integrate the advance organizer into their thinking process.

Table 25 : t-test of Students' Cognitive Level

COGNITIVE LEVEL	F	2-TAIL PROB	POOLED T	VARIANCE DF	ESTIMATE 2-TAIL PROB
LOW	0.00	1.000	0.00	0	1.000
MEDIUM	0.00	1.000	0.00	0	1.000
HIGH	0.00	1.000	0.00	0	1.000

4.4 Results of Questionnaire

The questionnaire is composed of two parts: ten closed-type questions and two open-type questions. The ten closed-type questions are analyzed quantitatively using t-test. A value of 5, 4, 3, 2, 1 are assigned to the item with 'strongly agree', 'agree', 'undecided', 'disagree', 'strongly disagree' respectively. Statistical findings are shown in Table 26 on the next page.

Results show that students in the treatment group, as compared to the control group, found that almost all areas (except one) proposed in the questionnaire were fulfilled in a significant manner. The areas include:

- a thinking framework has been provided to enhance learning
- a thinking framework has been provided to identify nursing problems in general

Table 26 : t-test Analysis of the Closed-type Questions in the Questionnaire

ITEM		MEAN	SD	F	2-TAIL PROB	POOLED VARIANCE ESTIMATE T	DF	2-TAIL PROB
ENHANCE LEARNING	C	4.00	0.68					
	T	4.27	0.56	1.49	0.154	-2.22	101	0.028
IDENTIFY GENERAL NURSING PROBLEM	C	3.92	0.06					
	T	4.16	0.06	1.08	0.787	-3.03	101	0.003
IDENTIFY SURGICAL NURSING PROBLEM	C	3.81	0.49					
	T	4.16	0.54	1.19	0.536	-3.45	101	0.001
IDENTIFY RESPIRATORY NURSING PROBLEM	C	3.94	0.52					
	T	4.15	0.44	1.36	0.276	-2.18	101	0.032
SOLVE GENERAL NURSING PROBLEM	C	3.83	0.56					
	T	4.11	0.42	1.80	0.037	-2.86	101	0.005
SOLVE SURGICAL NURSING PROBLEM	C	3.79	0.08					
	T	4.04	0.05	2.31	0.003	-2.55	101	0.012
SOLVE RESPIRATORY NURSING PROBLEM	C	3.75	0.60					
	T	4.09	0.48	1.56	0.120	-3.19	101	0.002
AID MEMORY IN GENERAL NURSING	C	3.83	0.83					
	T	4.15	0.49	2.92	0.000	-2.35	101	0.020
AID MEMORY IN SURGICAL NURSING	C	3.77	0.12					
	T	4.09	0.08	2.26	0.004	-2.33	101	0.022
AID MEMORY IN RESPIRA-TORY NURSING	C	3.89	0.75					
	T	4.09	0.55	1.84	0.031	-1.51	101	n.s.

C = control group T = treatment group

- a thinking framework has been provided to identify nursing problems in surgical nursing
- a thinking framework has been provided to identify nursing problems in surgical patients with respiratory conditions
- a thinking framework has been provided to solve nursing problems in general
- a thinking framework has been provided to solve nursing problems in surgical nursing
- a thinking framework has been provided to solve nursing problems in surgical patients with respiratory problems
- a thinking framework has been provided to aid memory in general nursing
- a thinking framework has been provided to aid memory in surgical nursing in general

The one item that is insignificant in the t-test is: 'a thinking framework has been provided to aid memory in the respiratory system of surgical nursing'.

The results of the two open-type questions are summarized below.

The control group have identified the following areas as most helpful. They are listed in order of popularity with the percentage representing the frequency of the item mentioned: group discussion (60.4%), demonstration (20.8%), distribution of lecture notes after group discussion (16.7%), case presentation (16.3%), feedback after group presentation

(14.6%), teacher's inducement of thinking (14.3%), opportunities for thinking various questions (6.3%), the use of X-ray as teaching aid (4.2%) and quality discussion questions (4.2%). Other helpful areas enlisted by individual student (2%) include summary after each lecture, pictorial explanation and stimulation of self study.

The areas identified by the treatment group as most helpful are listed in order of popularity as follows: group discussion (40%), feedback and discussion after group presentation (30.9%), distribution of lecture notes after group discussion (21.8%), case presentation (20%), teacher's inducement of thinking (14.5%), opportunities for thinking (10.9%), free and motivated learning atmosphere (9.1%), systematic increase in knowledge of surgical nursing (3.6%), pictorial explanation (3.6%) and learning how to add things to basics, that is, from general to specific (3.6%). Other helpful areas enlisted by individual student (1.8%) include quality discussion questions, stimulation of self-study, activity learning, thorough explanation of lecture contents, demonstration and making use of learned material to introduce new learning.

68.8% of the control group wrote 'nil' under the question asking for the least helpful area. Areas that have been mentioned as least helpful include: no model answers for group discussion questions (8.3%), excessive group discussion (6.3%), redundancy in discussion content (4.2%), each group

is only familiar to their discussion area (2.1%) and notes could be more detailed (2.1%).

87.3% of the treatment group stated 'nil' under the question asking for least helpful areas. 7.3% thought that discussion was excessive. Items that were mentioned only by one individual (1.8%) include : the number of discussion group members is too great, notes should be distributed first and the presence of two observers was distractive.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND LIMITATIONS

5.1 Discussion

5.1.1 Hypotheses

Hypotheses 1 and 2 have been rejected. As mentioned in the literature review, equal amount of studies have proved or failed to prove that advance organizer is facilitative to learning. This study belongs to the later category. Both the control and treatment groups in this study have made progress in their learning, but the collected data indicated that the control group have performed better than the treatment group. Possible explanations are as follows.

Firstly, the course of treatment in this study may not be strong enough. The treatment only involves 10 lectures out of 254 lectures in the same study block. It may not be sufficient to cause substantial change in the students. When the advance organizer effect cannot dominate, 'automatization' takes over. Every person has general memory concepts that help to organize the relevant material when approaching a new task. The person relates the new experience to things that have been done or heard about before. This is automatization. To develop a particular schema, the existing schema needs to be debugged. The new schema needs time to be 'automatized' (Norman, 1976). The subjects in this study may not have adequate time and preparation to incorporate the advance organizer into their actual thinking process.

Secondly, students of the control group have received the general pre- and post-operative care plans as the control organizer. The material in the control organizer, though lacking a nursing framework to guide thinking, consists of material which might be very familiar to the students. By definition, the control organizer is not a genuine advance organizer because it does not fulfill the three criteria of abstraction, generality and inclusiveness stated by Ausubel. The control group, however, may have received the control organizer which material resembles their previous learning as a kind of 'appetizer' for later learning. This may be one of the factors contributing to the findings that the control group have performed better than the treatment group in this study.

Thirdly, the new schema proposed by the advance organizer is a direct opposite of the old schema already possessed by the students. Clinical experience has always been a major component of nurses' training program. Knowledge about nursing most of the time is derived from experience. This is an inductive way of thinking, that is, drawing specific experience to make general conclusions. The advance organizer, on the contrary, advocates deductive thinking. It attempts to provide a thinking framework for students to think from general to specific. The two schema are so contradictory to each other that the students in the treatment group might require a great deal of effort to subsume the advance organizer under their cognitive structure

in order that the organizer could become effective.

Fourthly, the advance organizer provided in this study is a conceptual framework and students might have found it too abstract. The local nursing curriculum tends to build on very concrete substance. Students might have difficulties in comprehending conceptual ideas and integrating the ideas into their existing cognitive structure. Learning is inhibited when the abstraction level of the organizer is beyond the reasoning ability of the learner (Siu 1986).

Hypotheses 3 and 4 cannot be rejected, that is, student ability in general has no significant effects on problem solving and retention. The control group manage to reach a marginal significance level of 0.048, in retention performance, with the high ability group making most progress. The same high ability students in the control group also excel the medium and low ability students in problem solving, but the difference is not significant. The results seem logical because high ability students usually perform better, that is what made them categorized as 'high ability'. During treatment, the high ability group excels the low ability group in retention.

However, both the low ability group and the high ability group suffer a negative learning effect in problem solving performance. Again, the difference is not significant. The explanation could be that the high ability students might have their own meaningful cognitive structure and they found the advance organizer not useful. As for the low ability

group, they might have difficulty in understanding the conceptual framework, therefore, they exhibit negative effects in both retention and problem solving.

Hypotheses 5 and 6 cannot be rejected. The treatment x ability interaction is insignificant in both retention and problem solving. The explanations why the advance organizer could not exert significant impact on different ability groups could be a combination of the factors mentioned above.

As discussed under hypotheses 1 and 2, the treatment in this study has not been able to cause significant change in students' cognitive performance. In hypotheses 3 and 4, it is presented that the main effect of students' ability level has not been significant in either treatment or control group. The explanations have already been discussed above. With the results of hypotheses 1 and 2 , 3 and 4, it is likely that the interaction effect of treatment and ability is minimal.

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5.1.2 Observation

The levels of cognitive skills that have been employed by the treatment and control group are very similar. In view of the narrative notes of the observation, the result is hardly surprising. The treatment group students seemed to have made no effort in trying to integrate the use of the advance organizer during study. The reasons are very similar to those mentioned in section 5.1.1.

5.1.3 Questionnaires

Students in the treatment group have acknowledged in a more significant manner statistically than the control group, that a thinking framework has been provided for them to enhance learning, to identify and solve nursing problems in general as well as in surgical nursing within and without the respiratory conditions, and to aid memory in general and surgical nursing. In the open type questions, there are quite a number of common areas that have been identified by both the treatment and control groups as most helpful and least helpful. These areas mainly pertain to the teaching style and teaching methodology. With the same teacher teaching both groups, the areas that one group find useful would reasonably apply to the other group. However, there are also areas that are specificly identified by individual group. Some of the students in the treatment group have distinctly mentioned in the most helpful area that knowledge of surgical nursing could be systematically increased and one could learn to add things to the basic knowledge, from general to specific. The control group reveal in the least helpful area that they need more detailed notes and model answers for group discussion work. On the other hand, students in the treatment group have not made such demands. It could be possible that the nursing framework used as an advance organizer might have provided students with a sense of security for the anchorage of their learning.

The results of the questionnaires have also reflected

that the treatment group have found the advance organizer useful in their learning. It is interesting to note, however, that the treatment group have not performed as well as they think they would. Student interest appeared to be raised and maintained when advance organizer is used, yet advance organizer has no positive effect on cognitive performance. This finding coincides with the results in the study by Lane & Norman (1988). Reasons why students provided with advance organizer perform less well in this study have been already explained in the above discussion. Reasons why students' interest have been raised in the treatment group could be that the advance organizer, being foreign to students, acts as a stimulus to arouse curiosity and interest. It could also be possible that the intrinsic qualities of the advance organizer have attracted the students.

5.2 Implications

The implications of this study could be considered from three perspectives : the use of advance organizer in nursing education; curriculum innovation and curriculum evaluation.

5.2.1 The use of advance organizer in nursing education

The findings in this study have portrayed an interesting line of continuum in regard to the use of advance organizer in nursing education. The continuum is marked by the cognitive domain at one end, and the affective domain at the

other. At the end of the cognitive domain, it is represented by the posttest results which suggest that the control group excel the treatment group in cognitive performance. In the middle of the continuum is the classroom cognitive behaviour. Observation results reveal that there is no significant difference in the cognitive level between the control and treatment group during lecture. At the other end of the continuum is the affective domain. Findings of the questionnaire show that students in the treatment group express a significant degree of favouritism towards the use of advance organizer.

The findings of this study propose that advance organizer might be useful to raise the affective level in learning. This could be important when one believes that the process of education is as valuable as the product of education. This study suggests that the introduction of the advance organizer might have provided students with an enjoyable and positive learning experience. However, the use of advance organizer in improving cognitive performance needs to be established yet through further studies.

5.2.2 Curriculum innovation

This study begins with an intention to investigate the effectiveness of the use of advance organizer in curriculum innovation of nursing education. Although the results of the present study indicate that the control group have performed

better without the advance organizer, students in the treatment group actually think that they have got a framework to facilitate their learning. It is reckoned that the efficacy of advance organizer used in nursing education still needs to be investigated further. However, as discussed in section 5.1.1, the non-positive results could also be due to factors extrinsic to the advance organizer. The treatment effect in this study may not be strong enough and there could be a tendency that non-treatment sessions would have interfered with the learning during treatment. Also, 'automatization' effect could have dominated students' thinking.

The experience of this study might be able to provide some thoughts on curriculum innovation in general. Curriculum innovation needs to involve meticulous planning and consideration of every aspect that is related to the change. Each factor should be taken into account, whenever possible to minimize any counter-acting force, and to maximize the effect of change. For any change intended, it is advisable to initiate the change at the early stage of the training program in order that the possible interference of the original curriculum would be reduced with the introduction of the new curriculum design.

5.2.3 Curriculum evaluation

The third implication of this study concerns the approach of curriculum evaluation. Traditionally, the

effectiveness of curriculum change is measured by the achievement of students. If this is the only factor to be measured in this study, the proposed curriculum change could be counted as a failure. When a more comprehensive approach is adopted like in this study, it provides a different picture.

This study reveals that although students in the treatment group performed less well than the control group, they felt that the way they had learned was more effective. This reflects that how students perceive in regard to the effectiveness of teaching and learning do not necessarily predict how well they would actually perform. To measure students' achievement as the mere indicator of the effectiveness of a curriculum is insufficient. At the same time, it is also inadequate in curriculum evaluation that only questionnaires are sent out to collect students' opinion and then the results are used as the guideline for curriculum change. The illuminative approach of curriculum evaluation, reflecting the cognitive as well as the affective domain of students during learning might help to provide a more comprehensive view of the curriculum concerned.

5.3 Limitations

This study has the following limitations:

5.3.1 This study only involves the respiratory system in surgical nursing in one single school of nursing.

Results could not be generalized to the other parts of the curriculum because there has been discussion if one single framework or multiple frameworks should be used in a single curriculum. The framework that has been found useful / not useful in one system might mean differently for another system. The results also cannot be generalized to other schools of nursing because other schools might have different factors which might affect the outcome in using the advance organizer.

5.3.2 Roper's model has been selected in this study mainly because of its availability and simplicity. However, Roper's model has a number of shortcomings. Roper's model identifies man's needs on the basis of a list of daily activities, and health is assumed when all daily activities could be fulfilled with and/or without assistance. When the list is reviewed, one could see that there is a heavy emphasis on the physical aspect of a person. The psycho-social aspects are being undermined in Roper's model. Although Roper has mentioned that the twelve activities of living are inter-related, the precise relationship has not been explained. The effect of environment in the model is ill-defined also. The choice of a stronger nursing model with more explicit description of the four metaparadigms mentioned in section 2.4; and clear

statement of propositions indicating the connection among the four metaparadigms might help to enhance the learning effect of students.

5.3.3 Due to the already-packed curriculum, two different classes have been used for the control and treatment group in this study. The two classes are of the same level of training, and theoretically, they should have had the same kind of input since entrance to the school of nursing. However individual class characteristics might be present, and thus might have acted as extraneous variables which cannot be controlled in this study.

5.3.4 The data profile produced in this study seems to have a relatively heavy bearing on the cognitive domain. There are three data collection instruments involved in this study. They are the pre- and post-tests, observation and questionnaires. The questionnaires have reflected the affective aspect of the learning experience in this study, but both the tests and observation measure solely students' cognitive behaviour. The classroom observation tool could have incorporated observation of students' affective behaviour and the classroom atmosphere, in an attempt to produce a more balanced data file.

5.3.5 This study focuses on the retention and problem solving ability of students in writing and the clinical performance is not dealt with. The measured abiltiy in written form might not be able to reflect the performance in real situations. However, nursing is a practice discipline and the clinical performance is the ultimate judgement of a nurse. This study only measures the theoretical ability of the student nurse and the clinical abiltiy needs to be proved in time.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1 Summary

This study intends to provide some insights during curriculum innovation in nursing education. Local nursing curricula tend to focus on medical facts and the study programs are arranged mainly by accumulation of facts. Many educators such as Ausubel, Schwab, Bruner, Kelly, and so on have declared that the structure of knowledge of a discipline is very significant to induce meaningful learning. Meaningful learning implies that students can defend the acquired knowledge, recall what they have learned and transfer their learning to new situations. Contemporary medical services demand nurses to effectively deal with the rapid evolvement of medical technology, and at the same time, provide quality individual care. In the preparation of qualified nurses, the facilitation of meaningful learning is particularly important. Adopting the structure of knowledge that is specific to the discipline can be conducive to meaningful learning. Ausubel specifically suggests that the structure should be presented to students as advance organizer in order to secure students with a cognitive structure.

Based on the above ideation, the treatment in this study involves the provision of a nursing framework as advance

organizer. Two groups of student nurses with one-year nursing experience are used as study subjects. The treatment is applied in a series of 10 lectures pertaining to the study of surgical nursing of patients with respiratory problems. Quantitative and qualitative methods are used. The quantitative data collection and analysis consist of three parts. First, pretests and posttests are conducted. Results are analysed using analysis of covariance with pretest scores as covariate. Main effects of treatment, ability and the interaction between treatment and ability are looked into. Second, frequency counts of the observation of students' cognitive behaviour between the treatment and control groups are compared using t-test. Third, results of the questionnaires between the two groups are also compared using t-test. The qualitative part refers to the comments provided by students in the open-type questions of the questionnaire.

Results reveal that the control group have performed significantly better than the treatment group in the test; the main effect of students' ability in test performance is insignificant and there is no interaction between treatment and ability. There is no significant difference in the cognitive behaviour between control and treatment group during study. However, results of the questionnaire show that students in the treatment group have expressed in a more significant manner, as compared to the control group that they have attained a framework to enhance learning, aid memory, identify and solve nursing and surgical problems. In

the narrative part of the questionnaire, students in the control group have demanded for model answers and more detailed notes. This might indicate that students in the control group did not feel secure in their learning while the treatment group did not have the same need. This could be due to the fact that the students in the treatment group have been provided with advance organizer and they might have a sense of security in the anchorage of their learning.

This study has portrayed a very interesting picture of the use of advance organizer in nursing education. The findings could be displayed on a line of continuum. The continuum is marked by the cognitive domain at one end, and the affective domain at the other. At the end of the cognitive domain, it is represented by the test results which suggest that the control group excel the treatment group in cognitive performance. In the middle of the continuum is the classroom cognitive behaviour. Observation results reveal that there is no significant difference in the cognitive level between the control and treatment group during lecture. At the other end of the continuum is the affective domain. Findings of the questionnaire show that students in the treatment group express a significant degree of favouritism towards the use of advance organizer. Taking it all in all, it cannot be concluded that the advance organizer when adopted in nursing education is helpful or not helpful. Moreover, it can be postulated that advance organizer is useful to arouse students' learning interest. In regard to

the effect of the advance organizer on cognitive performance, further studies would be required.

6.2 Recommendations

6.2.1 Recommendations for further studies

It is recommended that further studies should be conducted to establish the advance organizer effect in nursing education. The studies should use new nursing entrants as study subjects so that students can subsume the advance organizer into their cognitive structure without the interference of previous learning. The students should be provided enough time and adequate explanation to digest the material if a conceptual framework is used. The treatment effect should be strong, which implies that the study should involve a substantial part of the curriculum. Illuminative approach should be adopted to provide a comprehensive picture of the effect of change.

6.2.2 Recommendations for curriculum innovation and evaluation

It is recommended that for any form of curriculum innovation, the change should not be episodic, but rather, should be well planned and comprehensive. The evaluation of curriculum innovation should be quantitative and qualitative, taking into consideration the product as well as the process. Also, the evaluation should account for the total learning experience, including cognitive, affective and psychomotor domains, if appropriate.

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APPENDIX 1 Request letter

Frances Kam Yuet Wong
Nurse tutor
The Nethersole School of Nursing
24 August, 1987

Ms. S. Lum
Senior Nursing Officer
The Nethersole School of Nursing

Dear Ms. Lum,

Re: Request for conducting a research in the school of nursing

I would like to ask your kind consideration for allowing me to carry out a research in the school of nursing. The rationale behind the study is that the contemporary nursing curriculum has been designed based on the medical model, which orientates the nurse to perceive the patient in terms of illness. However, nurses bear a unique role different from doctors, so I think we could cultivate better nurses by guiding the students to think within a nursing framework. Here followed is a brief scheme of my research project.

Aim: To evaluate the effectiveness of problem solving and retention of learning when using a nursing conceptual framework in the construction of a nursing curriculum.

Research design:

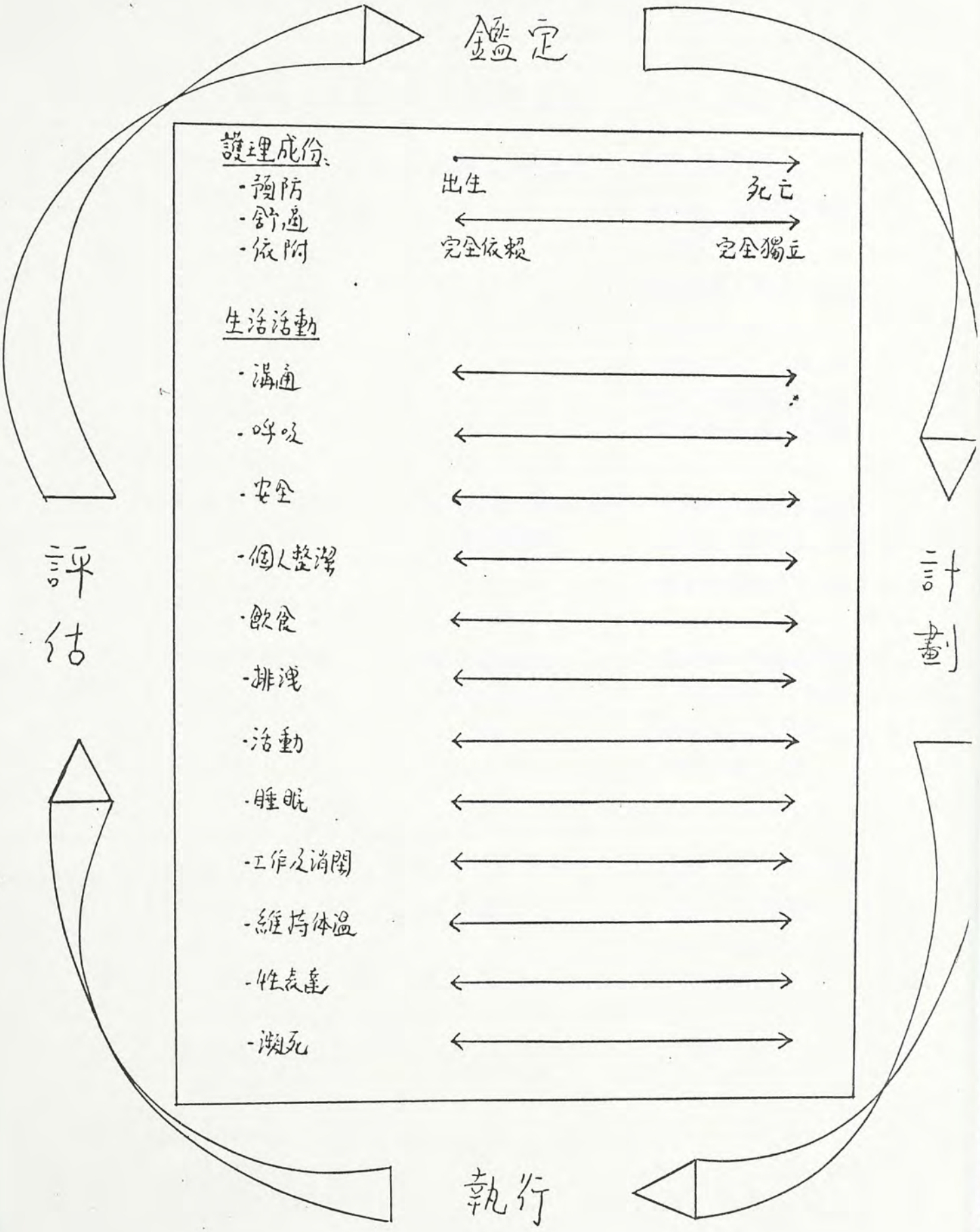
- experimental, involving second year nursing students of class 9/86, 1/87 and 5/87, eleven sessions of surgical nursing, respiratory system
- data collection by pre-test, post-test, observation and interview (one internal and one external observers will be invited to participate)

I hope this study will shed some light on our nursing curriculum in the preparation of nurses of high quality. This project is a graduation requirement of the M.A. (education) degree of the Chinese University of Hong Kong which I am pursuing now. Your help will be greatly appreciated.

Thank you!

Yours Sincerely,

Frances Kam Yuet Wong



NANCY ROPER (1976) 之生活活動護理模式

一般手術前護理計劃

術前 1

	生活活動	問題/需要	護理目標	護理行動
C_1	溝通	陌生環境及担心手術引致憂慮恐懼	緩解恐懼憂慮	.介紹病室環境 .聆聽，解釋手術過程及術後情況 .鼓勵家人參與、支持 .介紹成功病例 .安排參觀手術室 .術前按医囑給予藥物，如 PETHIDINE 助鎮靜
Sa_1	安全	需要法律上得到保障	確保病人明白才簽署接受手術	.安排外科医生解釋明白後才簽手術志願書 (昏迷，未成年者等特別處理)
Sa_2		需要有良好身体功能承受手術及麻醉	確保身体能安全地接受手術	.協助一般身体檢查如 X-光、生命表徵、心电圖、血、小便等 .有感染或有其他疾患者，先協助治療及控制
R_1	呼吸	術後呕吐未完全清醒，呕吐物易進入氣道	預防吸入性肺炎及氣道阻塞	.術前三至八小時禁食 (緊急 - 插胃喉抽清胃內容物) .術前按医囑給予藥物，例如 ATROPINE 以減分泌
R_2		術後活動減少，痰涎積聚	預防聚積性肺炎	.鼓勵戒烟 .教導深呼吸、咳痰運動
Pc_1	個人整潔	細菌積聚於皮膚，術後易引致感染	預防伤口感染	.術前全身清潔、剪指甲 .剃毛 - 範圍，勿損伤皮膚 .手術日 - 更換清潔衣帽、繞

	生活活動	問題 / 需要	護理目標	護理行動
Ed	飲食	病患可能引致食慾不振	維持足夠營養	. 鼓勵多進食高蛋白食物，足夠維生素、水份等 . 不能由口進食者，管餵或由靜脈輸入補充
El	排洩	麻醉後自主肌肉控制失調	減少手術期間失禁	. 術前清潔腸道、空虛膀胱
S	睡眠	術前準備令病者疲倦	促進休息及睡眠	. 提供安靜環境休息 . 需要時按醫囑給予安眠藥
M	活動	術後活動減少易引致血栓	預防血栓形成	. 教導術後肢体活動
W	工作及消閒	手術影响日常工作，引致經濟 / 家庭照顧問題	協助解決經濟 / 家庭照顧問題	. 轉介社會福利部 . 協助安排家務助理
Sa	安全	手術當日充份準備以接受手術	確保病者安全地進入手術間	. 核对清楚病者 . 完成手術前護理，如除去手飾、假牙、手術前服药注射等 . 再作生命表徵檢查，確保正常及作術後比較 . 帶同病人資料，陪同病人進入手術室
T Se D	維持体温 性表達 溝通	按個別病者需要而作補充		

一般手術後護理計劃

術後 1

	生活活動	問題/需要	護理目標	護理行動
C_1	溝通	担心手術之成功及術後癒合情況	緩解憂慮	-告訴病者手術已完成 -解釋術後之引流、儀器等 -情況許可，鼓勵家人陪伴
R_1	呼吸	麻醉药影响呼吸功能，術後未完全清醒，呕吐物易進入氣道	維持呼吸道通暢	-未清醒，平卧頭低 -观察呼吸 -給氧、吸痰（需要時） -清醒後，坐起以利呼吸
R_2		術後活動減少，痰涎積聚	預防並及早發現坠積性肺炎	-鼓勵深呼吸、咳痰運動 -給予蒸氣壺稀釋痰涎 -轉換卧式 -儘早活動 -观察感染徵狀，留痰標本作培菌
Sa_1	安全	失液过多/劇痛會引致休克	預防並及早發現休克	-補充失血失液，留意血色素、电解物等報告 -按医囑給予止痛药 -观察生命表徵 -观察伤口、引流出血量 -观察小便量、中枢静脉压等
Pc_1	個人整潔	術後易有傷口感染	促進傷口癒合	-術後初期，保持敷料完整 -力量淡液加無菌外敷料 -無菌技術換症 -观察伤口及滲液，注意感染情況 -伤口癒合後，7-14日拆線 -保持引流通暢，引流後減少，3-5日拆除
Pc_2		卧床休息又能自助	協助維持個人衛生	-禁食期間，口齒料理 -全身清潔

	生活活動	問題/需要	護理目標	護理行動
Ed1	飲食	手術影响正常飲食	維持足夠營養	·禁食期間,靜脉輸入補充,維持導管通暢 ·無呕吐,清醒,有腸蠕動声,可漸進式進食 ·高蛋白、維生素、水份等,以助組織修補
Ed2		若手術牽涉腸道,術後可能插有胃導管讓腸道休息	維持胃導管通暢	·每二至四小時抽清胃管 ·观察導出液 ·確保導管無移位、扭曲、受压等
El1	排泄	麻醉後易有尿潴留	確保泌尿道通暢	·观察術後小便 ·需要時,施行各种引尿法無效才協助插入導尿管
El2		長時間或泌尿道手術後會插有尿導管	維持尿導管通暢及預防泌尿道感染	·观察導出小便 ·確保導管無扭曲、受压,并於膀胱位置免尿液倒流 ·每日施行外陰拭抹
El3		麻醉後及活動減少易有腸癱瘓	確保腸道通暢	·观察大便情况、腸蠕動声 ·儘早活動 ·需要時,給予栓剂、直腸導管
M1	活動	卧床过久易引致 (i) 血栓 (ii) 压迫性潰瘍	預防血栓 預防压迫性潰瘍	·床上肢体活動 ·儘早下床活動 ·每兩小時轉換卧式 ·受压部位料理
Sl1	睡眠	術後不適影响休息	促進休息及睡眠	·需要時給予止痛药 ·安靜环境 ·平直被铺,維持舒适位置

術後3

	生活活動	問題/需要	護理目標	護理行動
W.	工作之消閑	手術影响日常工作引致经济/家庭照顧問題	協助解決经济/家庭照顧問題	·轉介社會福利部/安排家務助理
獨立 ↑	Indep.	回家康復需自我照顧	確保病者能回家自我照顧,促進康復	·教導病者各方面自我照顧: 滿面 活動 呼吸 睡眠 安全 工作之消閑 個人整潔 維持体温 飲食 性表達 排洩
↓ T Se D.	維持体温 性表達 激乳	按個別病者需要而作補充		

一般手術前護理計劃

術前 1

問題/需要	護理目標	護理行動
陌生環境及担心手術引致憂慮恐懼	紓解恐懼憂慮	.介紹病室環境 .聆聽，解釋手術過程及術後情況 .鼓勵家人參加、支持 .介紹成功病例 .安排參觀手術室 .術前按医囑給予藥物，如。PETHIDINE 助鎮靜
需要法律上得到保障	確保病人明白才簽署接受手術	.安排外科医生解釋明白後才簽手術志願書 (白痴，未成年者等特別處理)
需要有良好身体功能承受手術及麻醉	確保身体能安全地接受手術	.協助一般身体檢查如。X-光、生命表徵、心电圖、血、小便等 .有感染或有其他疾患者，先協助治療及控制。
術後呕吐未完全清醒，呕吐物易進入氣道	預防吸入性肺炎及氣道阻塞	.術前三至八小時禁食(緊急 - 插胃喉抽清胃內容物) .術前按医囑給予藥物，例如。ATROPINE 以減分泌
術後活動減少，痰涎積聚	預防聚積性肺炎	.鼓勵戒烟 .教導深呼吸、咳痰運動
細菌積聚於皮膚，術後易引致感染	預防伤口感染	.術前全身清潔、剪指甲 .剃毛 - 範圍，勿損伤皮膚 .手術日 - 更換清潔衣帽、鞋

術前 2

問題 / 需要	護理目標	護理行動
病患可能引致食慾不振	維持足夠營養	. 鼓勵多進食高蛋白食物，足夠維生素、水份等 . 不能由口進食者管飼或由靜脈輸入補充
麻醉後自主肌肉控制失調	減少手術期間失禁	. 術前清潔腸道、空虛膀胱
術前準備令病者疲倦	促進休息及睡眠	. 提供安靜環境休息 . 需要時按醫囑給予安眠藥
術後活動減少易引致血栓	預防血栓形成	. 教導術後肢体活動
手術影响日常工作，引致經济 / 家庭照顧問題	協助解決經济 / 家庭照顧問題	. 轉介社會福利部 . 協助安排家務助理
手術當日充份準備以接受手術	確保病者安全地進入手術間	. 核对清楚病者 . 完成手術前護理，如除去手飾、假牙、手術前服药注射等 . 再作生命表徵檢查，確保正常及作術後比較 . 帶同病人資料，陪同病人進入手術室

一般手術後護理計劃

術後 1

問題/需要	護理目標	護理行動
担心手術之成功及術後癒合情況	紓解憂慮	-告訴病者手術已完成 -解釋術後之引流、儀器等 -情況許可，鼓勵家人陪伴
麻醉药影响呼吸功能 術後未完全清醒吐吐物易進入氣道	維持呼吸道通暢	-未清醒，平卧頭低 -观察呼吸 -給氧、吸痰（需要時） -清醒後坐起以利呼吸
術後活動減少，痰涎積聚	預防並及早發現聚積性肺炎	-鼓勵深呼吸、咳痰運動 -給予蒸氣壺稀釋痰涎 -轉換卧式 -儘早活動 -观察感染徵狀，留痰標本作培菌
失液过多/劇痛會引致休克	預防並及早發現休克	-補充失血失液，留意血色素、电解物等報告 -按医嘱給予止痛药 -观察生命表徵 -观察伤口、引流出血量 -观察小便量、中枢静脉压等
術後易有傷口感染	促進傷口癒合	-術後初期，保持敷料完整 -力量淡液加無菌外敷料 -無菌技術換症 -观察伤口及淡液，注意感染情況 -伤口癒合後，7-14日拆線 -保持引流通暢，引流液減少，3-5日拆除
卧床休息不能自助	協助維持個人衛生	-禁食期間，口齒料理 -全身清潔

術後 2

問題/需要	護理目標	護理行動
手術影响正常飲食	維持足夠營養	· 禁食期間，靜脉輸入補充，維持導管通暢 · 無呕吐，清醒，有腸蠕動声，可漸進式進食 · 高蛋白、維生素、水份等，以助組織修補
若手術牽涉腸道，術後可能插有胃導管讓腸道休息	維持胃導管通暢	· 每二至四小時抽清胃管 · 观察導出液 · 確保導管無移位、扭曲、受压等
麻醉後易有尿潴留	確保泌尿道通暢	· 观察術後小便 · 需要時，施行各种引尿法無效才協助插入導尿管
長時間或泌尿道手術後會插有尿導管	維持尿導管通暢及預防泌尿道感染	· 观察導出小便 · 確保導管無扭曲、受压，併於膀胱位置免尿液倒流 · 每日施行外陰拭抹
麻醉後之活動減少易有腸癱瘓	確保腸道通暢	· 观察大便情况、腸蠕動声 · 儘早活動 · 需要時，給予栓剂、直腸導管
卧床过久易引致 (i) 血栓	預防血栓	· 床上肢体活動 · 儘早下床活動
(ii) 压迫性溃瘍	預防压迫性溃瘍	· 每兩小時轉換卧式 · 受压部位料理
術後不適影响休息	促進休息及睡眠	· 需要時給予止痛药 · 安靜环境 · 平直被舖，維持舒适位置

術後 3

問題/需要	護理目標	護理行動
手術影響日常工作引致經濟/家庭照顧問題	協助解決經濟/家庭照顧問題	·轉介社會福利部/安排家務助理
回家康復需自我照顧	確保病者能回家自我照顧,促進康復	·教導病者各方面自我照顧。 溝通　活動 呼吸　睡眠 安全　工作及消閒 個人整潔　維持体溫 飲食　性表達 排洩

外科呼吸系統練習

No. ____

1, 列出氣管造口術的適應症。

2, 列出接收一氣管造口術後病者床边应有之設備。

3, 列出肺膿腫徵狀。

4, 列出緩解一氣胸病者呼吸困难之護理行動。

5, 列出全肺截除術後廿四小時內, 有何護理行動可促進病者舒適。

6, 列出一肺葉截除術後病者所需之出院指導。

7, 請參閱個案二則，並就所提供的資料，找出病者即時之問題/需要及護理目標。

入院情況：李強，51歲商人，經門診部入院。過去兩個月每日傍晚有發熱和寒顫每次皆自行服用退熱药病情況稍有好轉。有咳痰痰呈黃綠色，含血絲，活動時容易有氣促，過去兩個月食慾大減，共輕了卅磅。入院時，靜坐期間仍有輕微氣促，有發熱，生命各徵檢查如下：血压 140/80 mm Hg，脉搏 98/分鐘，呼吸 24/分鐘，体溫 38°C。病者一直都拒絕入院檢查，因情況一直未有好轉，故求診医院，由女兒陪同入院。病者有妻子，一子一女同住，子女已外出工作，經濟情況良好。

过去病历：一向健康良好，吸烟卅年，三年前已戒烟。

现在情況：入院第十天，安排明天接受右肺戴除術。
经过支氣管窺鏡之取組織作細胞學檢查後，証實病者有支氣管原發鱗狀細胞癌，腫肿位於右肺葉支氣管入口處，肝臟掃、骨臟掃及其他檢查報告顯示癌細胞未有遷徙，医生决定為病者進行手術治療。病者接受抗生素治療後，肺炎已受到控制，無發熱，痰涎白色，但份量多。術前之檢查顯示病者有輕度貧血，11.8Gm/dl，主診医生認為暫不需要輸血，其餘檢查正常。病者曾一度拒絕手術，希望藉做善事能免去此一災难，家人对於病者十分支持，不斷勸病者順從，協助他接受事實，最後病者同意明天接受手術。今天病者精神良好，但对於家人仍未到訪顯得有些不耐煩，病者表示有些事情希望手術前先嘱托家人。

入院情況：陳文，81歲男病人，由交通意外入院，入院時清醒，但呼吸困難，肺X-光顯示病者有右边鎖骨骨折及右边第三、九肋骨骨折，医生立刻替病者插入胸膜腔引流，並插入氧管吸氧管以連接人工呼吸机。
除胸部創伤外，病者並無其他外伤。
病者與兒子及媳婦同住，経済情況良好。

過去病历：卅年前有肺結核病，三年前因眼疾引致左眼失明，無其他病历。

現在情況：入院第廿五日。已接受氧管切開造口術第十八天，能自行吸痰。
生命表徵检　血压 110/80 mm Hg　脉搏 94/分鐘
呼吸 28/分鐘　体温 37.5°C
Astrup 報告：　PH 7.37　PO_2 56 mm Hg　PCO_2 55 mm Hg
HCO_3^- 33　BE +6
Astrup 報告顯示血中氧量偏低，接医嘱加氧氧总給由28%至30%。
痰液黃色，量多，粘稠度高，物理治療師每日兩次幫病者拍痰。
肺部創伤後，胸膜腔積膿留有一胸膜腔引流作Neomycin 灌洗，每日由医生施行，引流無需接駁於水封式引流瓶。
病者今天感得疲倦，家人剛探望病者並協助病者能由肉湯，病者進食情況良好。

APPENDIX 6 Questionnaire

外科呼吸系統教學問卷調查

	非常同意	同意	不能肯定	不同意	非常不同意
1, 課堂中有提供一思想架構去增強學習					
2, 課堂中有提供一思想架構去辨認一般護理問題					
3, 課堂中有提供一思想架構去辨認一般外科護理問題					
4, 課堂中有提供一思想架構去辨認呼吸系統內之外科護理問題					
5, 課堂中有提供一思想架構去解決一般護理問題					
6, 課堂中有提供一思想架構去解決一般外科護理問題					
7, 課堂中有提供一思想架構去解決呼吸系統內之護理問題					
8, 課堂中有提供一思想架構去幫助記憶一般護理資料					
9, 課堂中有提供一思想架構去幫助記憶外科護理資料					
10, 課堂中有提供一思想架構去幫助記憶呼吸系統內之外科護理資料					

11, 你認為課堂中最有幫助的是：(請用背頁書寫)

12, 你認為課堂中最無幫助的是：(請用背頁書寫)